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Subject	**CAZ Diversion Impact to East of Bath**	**Project Name**	Bath Clean Air Plan
Attention	B&NES Council	**Project No.**	674726.BR.42
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1. Introduction

In 2017 the government published a UK Air Quality Plan for Nitrogen Dioxide[1] setting out how compliance with the EU Limit Value for annual mean NO_2 will be reached across the UK in the shortest possible time. Due to forecast air quality exceedances, B&NES, along with 27 other Local Authorities, was directed by Minister Therese Coffey (Defra) and Minister Jesse Norman (DfT) in 2017 to produce a Clean Air Plan (CAP). The Plan must set out how B&NES will achieve sufficient air quality improvements in the shortest possible time. In line with Government guidance B&NES is considering implementation of a Clean Air Zone (CAZ), including both charging and non-charging measures, in order to achieve sufficient improvement in air quality and public health.

This note provides a high-level analysis of the potential impact of a Class D Charging Clean Air Zone (CAZ) in terms of diversion of A36 North-South through trips onto routes to the east of the city. For reference, the proposed CAZ boundary (as per the October 2018 draft OBC) is shown in

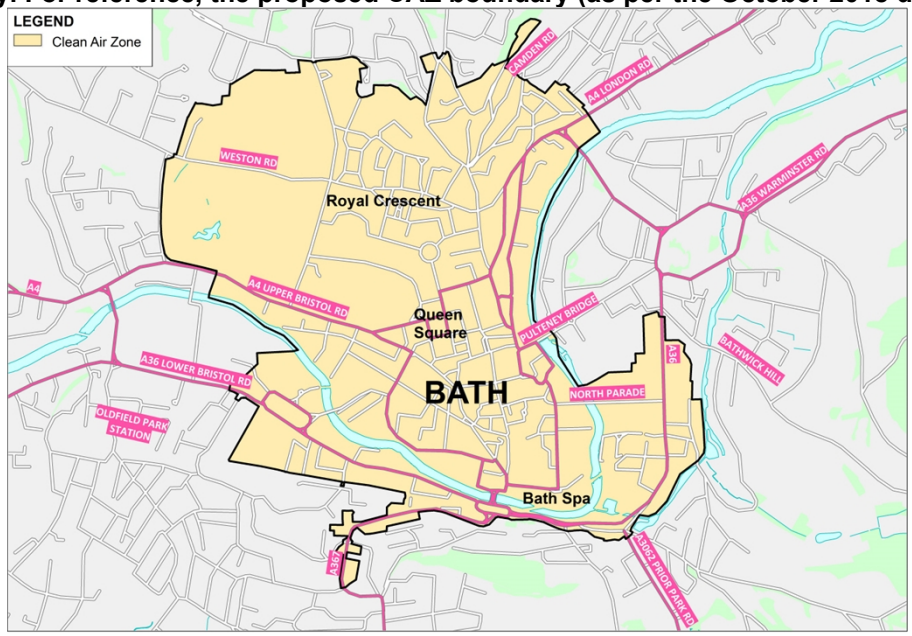

Figure 1 below.

[1] https://www.gov.uk/government/publications/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017

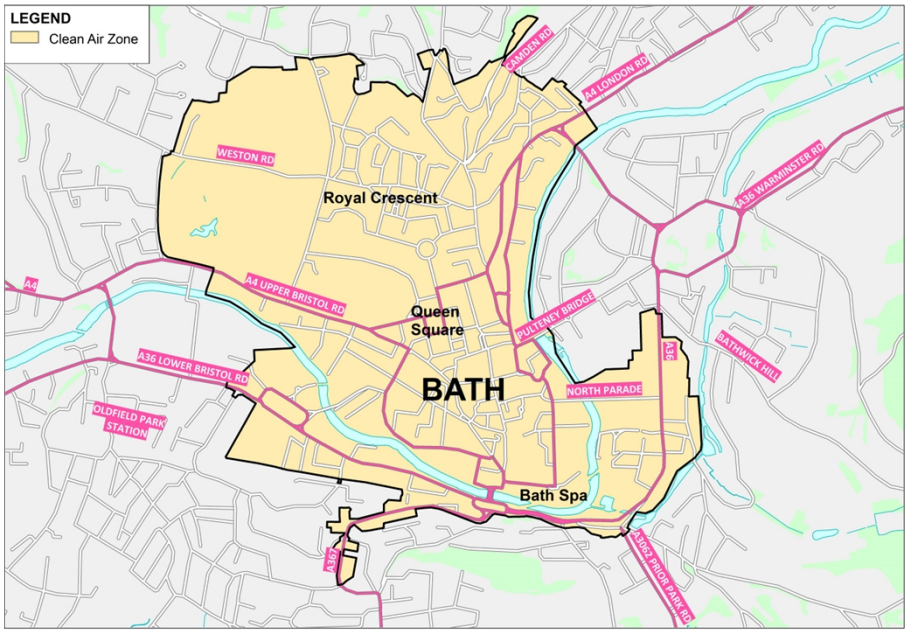

Figure 1: Proposed Boundary in draft OBC

This note provides a summary of the analysis undertaken during the assessment of the Bath CAP.

2. Trips Impacted by CAZ

2.1 Availability of Modelling and Data

Modelling of the CAZ work was undertaken in the latest iteration of the GBATH model. The study area and validation of this model is focused on the City of Bath itself and as such towns to the east are in the 'external' area of the model and, while flows between them and Bath would be expected to be accurate, flows within them may not be.

A 32 site two-week ANPR survey in November 2017 was undertaken in Bath to support the analysis of the CAP. This covered an outer cordon around the edge of the city, an inner cordon covering the central 2km diameter of Bath and also camera sites at the major car park entrances and exits. DVLA data for each number plate was obtained, providing full information on the vehicle including the type, size, fuel and euro standard allowing the compliancy with the Defra CAZ Framework[2] criteria to be assessed.

Wiltshire County Council has provided some further data consisting of a number of ATC sites across south west Wiltshire and a 5 site ANPR survey cordon of the town of Westbury.

2.2 Analysis of ANPR Data

A maximum level of potentially impacted, and therefore diverted, traffic can be established from the Bath ANPR survey. Specifically, the survey had sites on the A46 to the north of Bath, on London Rd, just to the east of the Cleveland Place junction and either side of Bathampton on the A36 providing an

[2] Defra & DfT (May 2017) *Clean Air Zone Framework: Principles for setting up Clean Air Zones in England.* https://www.gov.uk/government/publications/air-quality-clean-air-zone-framework-for-england

accurate picture of the quantity of traffic using the strategic route and how much of this is non-compliant.

Analysis of the trip chains of the ANPR data indicates there were an average of 2,300 daily movements making that strategic route of which approximately 450 were HGVs. Filtering down to traffic that is non-compliant with CAZ standards and would have to pay any charge indicates around 1,200 daily vehicles, of which 175 were HGVs.

By the time any CAZ is implemented by 2021 the numbers of non-compliant vehicles are already expected to have reduced significantly due to the ongoing replacement of vehicles. Projections used in the modelling were provided by Defra via their Emissions Factor Toolkit indicate that the number of non-compliant cars and LGVs is expected to have halved by 2021, while the number of non-compliant HGVs is expected to have reduced by over 60%.

Taking that into account would put an upper limit on the number of non-compliant through trips at 565 on a typical weekday, with 65 of those being HGVs.

2.3 Data from Wiltshire Council

The counts provided by Wiltshire Council indicate typical daily two-way volumes of 7,000 vehicles on the B3108 north of Winsley, 12,000 (12hr 07:00-19:00) on the A350 to on the northern edge of Westbury and 12,500 on the A363 between Bradford on Avon and Farleigh Wick.

2.4 Analysis of Traffic Model Outputs

It is expected that a high number of the uncompliant trips in 2021 would replace their vehicle with a compliant one in response to the proposed CAZ. This behaviour is particularly anticipated for HGVs as a large proportion of the HGV fleet is national, and 27 other local authorities are considering implementing a charging CAZ as part of their CAP, including Bristol. Under the Defra CAZ Framework, HGVs are charged under all but one class of CAZ.

The detailed assessment work undertaken suggests that around 50% of non-compliant cars, 65% of non-compliant LGVs and 80% of non-compliant HGVs will replace their vehicle in response to the proposed CAZ.

The actual response of vehicles will vary somewhat based on the trips they are undertaking, for instance a trip travelling through Bath may have an option to avoid the zone, whilst a trip travelling into the zone does not. The outputs from the highway models will therefore provide an estimation on the final impact of the CAZ.

Looking at the differences between the baseline model (2021 scenario without CAP) and the proposed CAZ model shows a small increase in traffic on the B3109 of around 80 PCU (passenger car units) a day north of Bradford on Avon and 30 south of it. There is also a slight increase in traffic of around 30 PCU a day on the B3108 to the west of Bradford-on-Avon. However, there are reductions of around 100 PCU on the A363 between Bradford-on-Avon and Bathford and 70 on the route between Bradford-on-Avon and Holt. In Bradford-on-Avon there are both small increases and decreases in traffic, but the overall change is a slight reduction. The model shows no significant impact upon Westbury.

A number of select link analyses were also performed on the A36, A46 and A350 to establish the level of diversion induced by the CAZ. It was found that the diversion to the A350 was less than 1 PCU in the AM and PM peaks. There was also minimal impact found on the B3109 suggesting that traffic changes on the B3109 are from traffic rerouting locally rather than in the wider region. Despite the

overall traffic drop on the A363, there was some use of this as a diversion by traffic on the A46 north of bath however the change was a maximum of 6 pcu in any modelled hour.

It should be considered that the responses to the CAZ are complex and interconnected. The CAZ removes some traffic from the network entirely through trips that change mode or no longer travel at all, this in turn reduces delay within Bath which attracts back trips that may have been diverting around the city already. Considerable numbers of trips from towns like Bradford on Avon also commute to Bath and changes to their behaviour will impact along the length of the trip including within the town of origin.

3. Summary

The total number of non-compliant through trips forecast to be affected by the proposed CAZ in Bath in 2021 would represent, at most, 5% of the traffic already using roads such as the A363 and A350. It is expected that only a small proportion will avoid the zone and those would not all divert along the same route. Traffic travelling to and from the east of Bath will also respond to the CAZ in a number of interconnected ways and the vast majority of the countries HGV fleet is expected to be compliant as a result of the implementation of CAZs in a number of cities.

The forecast impact of the CAZ on roads to the east of Bath therefore is expected to be overall neutral with individual changes in volumes making up at most 1% reductions or increases in daily volume.

As part of the Clean Air Plan, B&NES is proposing to expand its network of traffic and air quality monitoring in order to understand the impact of the CAZ. This could be further extended to include analysis of similar monitoring data collected by Wiltshire Council. The analysis of the data collected in Wiltshire can then be used within the ongoing assessment of the scheme performance and inform appropriate refinements should they be deemed necessary by B&NES.